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EXAMINER

DALEY, CHRISTOPHER ANTHONY

ART UNIT	PAPER NUMBER
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2111

MAIL DATE	DELIVERY MODE
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05/07/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/814,426	Applicant(s) MATTHEWS ET AL.	
	Examiner Christopher A. Daley	Art Unit 2111	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 28 March 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-56 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1-56 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION**1. Status of Claims**

An inadvertent deletion and re-numbering of the claims as presented in the 6/30/2006 amendment have occurred. Per rule 1.126, the claims have been renumbered with the original numbering as the basis.

Claims 1-9,11-16,18-40,42-51,53 – 56 are pending as presented in 6/30/2006 response.

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Original claims 10, 17, 41, and 52 were not presented in the latest claim submission and are considered as presented in the amended claims set of the 6/30/2006 response.

. § 1.126 Numbering of claims.

The original numbering of the claims must be preserved throughout the prosecution. When claims are canceled the remaining claims must not be renumbered. When claims are added, they must be numbered by the applicant consecutively beginning with the number next following the highest numbered claim previously presented (whether entered or not). When the application is ready for allowance, the examiner, if necessary, will renumber the claims consecutively in the order in which they appear or in such order as may have been requested by applicant.

A formal correction of claim numbering is requested.

Claim Rejections - 35 USC § 102

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claim 1 is rejected under 35 U.S.C. 102(a) as being anticipated by Ranganathan et al (WO 2004021684) hereinafter Ranganathan.

2. As to claims 1, Ranganathan discloses a communication apparatus: a radio frequency (RF) circuit for operating on a radio frequency signal; and a digital processing circuit coupled to the RF circuit, wherein the digital processing circuit includes:

a first bus master coupled to a bus (Figure 2 illustrates a multi-processor device, comprising a communication processor 18, and a application processor 36. Said processors are coupled to a bus 24, page 4, paragraph 0015);

wherein accesses by the one or more other bus masters to the bus are restricted in response to a signal indicative of a change in a mode of operation of the RF circuit (Figure 3 illustrates the change in the phone mode which involves RF signals from wireless communication circuitry in Figure 2, page 7, paragraph 0025);

wherein accesses by the one or more other bus masters to the bus are restricted during a second period of operation in response to a signal asserted a predetermined amount of time prior to a shutdown mode of operation of the digital processing circuit (Figure 3 illustrates in step 68, the application processor being placed in shutdown mode, page 7, paragraph 0025) .

one or more other bus masters coupled to the bus (Figure 2 illustrated a plurality of bus masters, such as 18, and 36, and 48 coupled to bus 24; and configured to arbitrate between requests to access the bus by the first bus master and the one or more other bus masters;

wherein the bus arbiter is further configured to implement a less favorable arbitration policy for the one or more other bus masters in response to a signal indicating a change to an active mode of operation of the RF circuit (The de-energizing of application processor would indicate said arbitration policy, page 7, paragraph 0024).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1 – 31, 38 - 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haartsen (US5842037) in view of Hadwiger et al (US6738845) hereinafter Hadwiger.

5. As to claims 1, 26, 38, 42, 49, and 53 Haartsen discloses a communication apparatus, method, and phone comprising: a radio frequency (RF) circuit for operating on a radio frequency signal; and a digital processing circuit coupled to the RF circuit, wherein the digital processing circuit includes:

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a first bus master coupled to a bus (Figure 1 illustrates a processor comprising a bus master 12 coupled to a bus 14);

wherein accesses by the one or more other bus masters to the bus are restricted in response to a signal indicative of a change in a mode of operation of the RF circuit (Interrupt signal dictates operation of bus master, as it indicates mode of RF circuit, COL. 2, lines 9 – 18);

wherein accesses by the one or more other bus masters to the bus are restricted during a second period of operation in response to a signal asserted a predetermined amount of time prior to a shutdown mode of operation of the digital processing circuit (interrupt process is repeatable as signal nature is bursty, thus affording multiple insertion of the interrupt signal, COL. 1, lines 61 – 67) .

Haartsen does not explicitly disclose one or more other bus masters coupled to the bus; and configured to arbitrate between requests to access the bus by the first bus master and the one or more other bus masters;

wherein the bus arbiter is further configured to implement a less favorable arbitration policy for the one or more other bus masters in response to a signal indicating a change to an active mode of operation of the RF circuit.

However, Hadwiger teaches one or more other bus masters coupled to the bus; and a bus arbiter configured to arbitrate between requests to access the bus by the first bus master and the one or more other bus masters as system illustrated in figure 2 comprises multiples bus masters such as 201 and 202 with arbiter 211 that configures the common bus access between said masters, (page 1, paragraph 0010).

This provides a cost effective solution for mobile phones that requires multiple processors, page 1, paragraph 0002.

The arbitration module is programmed to afford less favorable access to devices not on the common local bus, (page 3, and paragraph 0025).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the processor of Haartsen with the multiple processor core of Hadwiger to provide a cost effective solution for mobile phones that requires multiple processors, page 1, paragraph 0002.

6. As to claims 2,23, and 27, are Haartsen discloses the communication apparatus wherein the signal is indicative of a change to an active mode of operation of the RF circuit (Figure 1 illustrates an interrupt signal 18 used to indicate the active mode of the RF circuit, Col. 2, lines 9 – 18).

7. As to claim 3, Haartsen discloses the communication apparatus wherein the signal indicates a change to a transmission mode of operation of the RF circuit (Figure 1 illustrates an interrupt signal 18 used to indicate the active mode of the RF circuit, Col. 2, lines 9 – 18).

8. As to claim 4, Haartsen discloses the communication apparatus as recited in claim 2 wherein the signal indicates a change to a reception mode of operation of the

RF circuit (Figure 1 illustrates an interrupt signal 18 used to indicate the active mode of the RF circuit, Col. 2, lines 9 – 18).

9. As to claims 5, 28, 24, 34, and 43 Haartsen discloses the communication apparatus wherein the signal is asserted a predetermined amount of time prior to the change to the active mode of operation of the RF circuit (Said limitation, COL. 3, lines 33 – 49).

10. As to claims 6,29,35,40,51 Haartsen discloses the communication apparatus wherein the signal is asserted a predetermined amount of time prior to a shutdown mode of operation of the digital processing circuit (Said limitation, COL. 3, lines 33 – 49).

11. As to claims 7,30, and 36 Haartsen discloses the communication apparatus wherein the signal indicative of a change of mode of operation of the RF circuit is generated by a timing circuit (It is well known in the art that interrupts are generated from timing circuits, COL. 3, lines 50 – 56).

12. As to claims 8,25,31,37, 39, and 44 Hadwiger discloses the communication apparatus wherein the first bus master is provided exclusive access to the bus in response to assertion of the signal (When the first bus master asserts control, it has exclusive access, page 4, paragraph 0044).

13. As to claims 9, and 45 Hadwiger discloses the communication apparatus wherein the first bus master is a microcontroller unit (MCU) (said limitation is depicted in figure 2, page 2, paragraph 0023).

14. As to claim 10, Hadwiger discloses the communication apparatus wherein the first bus master is a digital signal processor (DSP) (said limitation is depicted in figure 2, page 2, paragraph 0023).

15. As to claim 11, Hadwiger discloses The communication apparatus wherein an interrupt signal is provided to the MCU and wherein an interrupt service routine executed by the MCU in response to assertion of the interrupt signal is performed when accesses by masters other than the first bus master to the bus are restricted (Said limitation, page 4, paragraph 0044).

16. As to claim 12, Hadwiger discloses the communication apparatus wherein the interrupt service routine performs functionality to prepare the digital processing circuit for a shutdown mode of the digital processing circuit (Said limitation, page 4, paragraph 0044).

17. As to claim 13, Hadwiger discloses the communication apparatus wherein the bus is a multi-layer bus, wherein the first bus master is provided exclusive access to one layer of the bus in response to assertion of the signal while the one or more other bus masters are allowed access to another layer of the multi-layer bus (Multiple

arbitration systems and buses are present to afford access to other bus system concurrently, page 2, paragraph 0023).

18. As to claim 14, Haartsen discloses the communication apparatus wherein the shutdown mode of operation includes disabling at least a portion of the digital processing circuit (stopping the processor clock is a method implemented, COL. 3, lines 35 – 40).

19. As to claim 15, 41, and 52, Haartsen discloses the communication apparatus wherein the shutdown mode of operation includes disabling a clock that clocks at least a portion of the digital processing circuit (stopping the processor clock is a method implemented, COL. 3, lines 35 – 40).

20. As to claim 16, Hadwiger discloses the communication apparatus wherein the bus arbiter is configured to restrict the granting of ownership of the bus to the one or more other bus masters in response to the signal (The arbiter module BAM of figure 2 dictates bus ownership, page 1, paragraph 0010).

21. As to claim 17, Hadwiger discloses the communication apparatus wherein the one or more other bus masters are configured to inhibit requests to gain ownership of the bus in response to the signal (The arbiter module BAM of figure 2 dictates bus ownership, page 1, paragraph 0010).

22. As to claim 18, 22, 46, and 56 Hadwiger discloses the communication apparatus wherein accesses by the one or more other bus masters are restricted by implementing a less favorable arbitration policy for the one or more other bus masters in response to the signal (The arbitration module is programmed to afford less favorable access to devices not on the common local bus, page 3, paragraph 0025).

23. As to claim 19, Hadwiger discloses the communication apparatus wherein accesses by the one or more other bus masters to the bus are restricted by terminating burst transfers early in response to the signal (The arbitration module is programmed to afford less favorable access to devices not on the common local bus, page 3, paragraph 0025).

24. As to claim 20, Haartsen discloses the communication apparatus wherein the signal indicative of a change of mode of operation of the RF circuit is generated in response to execution of a software instruction (Said signal is generated by a computer port that would indicate software origin, COL. 3, lines 25 – 30).

25. As to claim 21, Haartsen discloses a method of operating a communication apparatus including a radio frequency (RF) circuit and a digital processing circuit, the method comprising:

receiving a signal indicative of a change in a mode of operation of the RF circuit (Figure 1 illustrates an interrupt signal 18 used to indicate the active mode of the RF circuit, Col. 2, lines 9 – 18); and restricting accesses by the one or more other bus masters to the bus in response to the signal (The processor is placed in a frozen state, while the RF circuit is in active mode, Col. 2, lines 24 – 26); Haartsen does not explicitly teach arbitrating between requests to access a bus by a first bus master and one or more other bus masters;

However, Hadwiger teaches arbitrating between requests to access a bus by a first bus master and one or more other bus masters as system illustrated in figure 2 comprises multiples bus masters such as 201 and 202 with arbiter 211 that configures the common bus access between said masters, (page 1, paragraph 0010).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Haartsen with that of Hadwiger to provide a cost effective solution for mobile phones that requires multiple processors, page 1, paragraph 0002.

26. As to claim 22, Hadwiger discloses the method wherein accesses by the one or more bus masters are restricted by implementing a less favorable arbitration policy for the one or more bus masters in response to the signal (The arbitration module is programmed to afford less favorable access to devices not on the common local bus, page 3, paragraph 0025).

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27. As to claim 47, Haartsen discloses the communication apparatus as recited in claim 46 wherein the interrupt service routine performs functionality to prepare the digital processing circuit for a shutdown mode of the digital processing circuit (Said limitation, page 4, paragraph 0044).

28. As to claim 50, Haartsen discloses the mobile phone as recited in claim 49 wherein the first bus master is provided exclusive access to the bus during the second period of operation (When the first bus master asserts control, it has exclusive access, page 4, paragraph 0044).

29. As to claim 51, Haartsen discloses the mobile phone wherein the shutdown mode includes disabling at least a portion of the digital processing circuit (stopping the processor clock is a method implemented, COL. 3, lines 35 – 40).

30. As to claim 54, Haartsen discloses the communication apparatus wherein the first bus master is provided exclusive access to the bus during the second period of operation.

31. As to claim 55, Haartsen discloses the communication apparatus wherein the second period of operation is controlled by a timing circuit.

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32. Claims 32 – 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haartsen in view of Hadwiger, and further in view of Singh et al (US20030214348) hereinafter Singh.

33. As to claim 32, Haartsen/Hadwiger discloses a mobile phone comprising: a radio frequency (RF) front-end circuit for operating on a radio frequency signal; Haartsen teaches a digital processing circuit coupled to the RF front-end circuit, wherein the digital processing circuit includes a first bus master coupled to a bus and one or more other bus masters coupled to the bus (Figure 1 illustrates RF circuit 10 coupled to bus master 12 through bus 14); and Hadwiger teaches a bus arbiter configured to arbitrate between requests to access the bus by the first bus master and the one or more other bus masters (first bus master and the one or more other bus masters as system illustrated in figure 2 comprises multiples bus masters such as 201 and 202 with arbiter 211 that configures the common bus access between said masters, (page 1, paragraph 0010); Haartsen teaches wherein accesses by the one or more other bus masters to the bus are restricted in response to a signal indicative of a change in a mode of operation of the RF front-end circuit (interrupt signal 18 indicates mode of RF circuit, COL. 1, lines 60-- 67); and Haartsen as modified by Hadwiger, do not explicitly disclose wherein the RF front-end circuit and the digital processing circuit are fabricated on a single integrated circuit chip.

However, Singh teaches wherein the RF front-end circuit and the digital processing circuit are fabricated on a single integrated circuit chip to supply a SOC solution that suppresses the noise coupling, (page 1, paragraph 0008).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have the RF front-end circuit and the digital processing circuit fabricated on a single integrated circuit chip as specified by Singh to provide a SOC solution that suppresses noise, (page 1, paragraph 0008).

34. As to claim 33, Haartsen discloses the mobile phone wherein the signal is indicative of a change to an active mode of operation of the RF front-end circuit (Figure 1 illustrates an interrupt signal 18 used to indicate the active mode of the RF circuit, Col. 2, lines 9 – 18).

35. As to claim 34, Haartsen discloses the mobile phone wherein the signal is asserted a predetermined amount of time prior to the change to the active mode of operation of the RF front-end circuit (predetermined time is guard time, COL. 4, lines 18 – 25).

36. As to claim 35, Haartsen discloses the mobile phone wherein the signal is asserted a predetermined amount of time prior to a shutdown mode of operation of the digital processing circuit (predetermined time is guard time, COL. 4, lines 18 – 25).

37. As to claim 36, Haartsen discloses the mobile phone wherein the signal indicative of a change of mode of operation of the RF front-end circuit is generated by a timing circuit (It is well known in the art that interrupts are generated from timing circuits, COL. 3, lines 50 – 56).

38. As to claim 37, Haartsen discloses the mobile phone wherein the first bus master is provided exclusive access to the bus in response to assertion of the signal (When the first bus master asserts control, it has exclusive access, page 4, paragraph 0044).

39. As to claim 48, Haartsen discloses the communication apparatus as recited in claim 42 wherein the RF circuit and the digital processing circuit are integrated on a single chip (Singh teaches of an SOC solution that integrates RF circuits, and digital circuits on the same piece of silicon, page 1, paragraph 0008).

Response to Arguments

40. Applicant's arguments filed 6/30/2007 have been fully considered but they are not persuasive. With regards to the applicant's argument that prior art does not teach a bus arbiter, the examiner points to the following teaching. Hadwiger teaches one or more other bus masters coupled to the bus; and a bus arbiter configured to arbitrate between requests to access the bus by the first bus master and the one or more other bus masters as system illustrated in figure 2 comprises multiples bus masters such as

201 and 202 with arbiter 211 that configures the common bus access between said masters, (page 1, paragraph 0010).

With regards to the applicant's argument that prior art does not teach a mobile phone, the examiner points to the following teaching. Hadwiger teaches a bus arbiter configured to arbitrate between requests to access the bus by the first bus master and the one or more other bus masters (first bus master and the one or more other bus masters as system illustrated in figure 2 comprises multiples bus masters such as 201 and 202 with arbiter 211 that configures the common bus access between said masters, in a mobile phone (page 1, paragraph 0010);

Conclusion

41. Applicant's submission of an information disclosure statement under 37 CFR 1.97(c) with the fee set forth in 37 CFR 1.17(p) on March 28, 2007 prompted the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 609.04(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

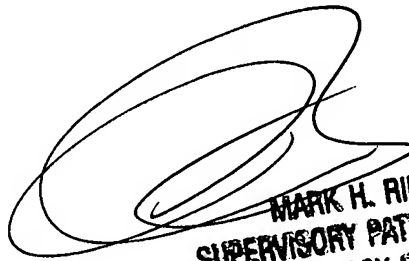
the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher A. Daley whose telephone number is 571 272 3625. The examiner can normally be reached on 9 am. - 4p m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Rinehart can be reached on 571 272 3632. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

4/30/2007
CAD



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